

Cation exchange resins

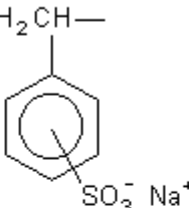
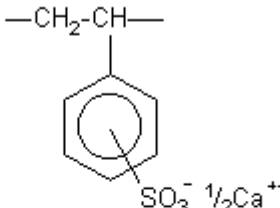
DIAION UBK Series

Resins with sulfonic acid as the functional group can dissociate in aqueous solutions and show strong acidity. They can exchange positive ions such as Na^+ and Ca^{2+} .

SAC resins can exchange cations in all pH range and relatively stable at high temperatures (actually stable at 100 ~ 120°C). Therefore, they are used in a wide range of application areas, such as water treatment, purification of food and pharmaceuticals, reaction catalysts, and so on.

The sulfonic acid group ($-\text{SO}_3\text{H}$), active group in these resins, is strongly acidic and dissociates not only in alkaline solutions but also in acidic solutions to $-\text{SO}_3^-\text{H}^+$ form. We have explained that we call $-\text{SO}_3^-$ as a fixed ion and H^+ as a counter ion in the previous section, and the ion exchange reactions are the exchange reactions of counter ions. SACERs can exchange their counter ions even with neutral salts as with bases.

Once a fixed ion has been replaced by another cation, the resin can't exchange any more. To use repetitively, we have to regenerate the cation exchange resins to their original $\text{R}-\text{SO}_3\text{H}$ forms after they are used for the exchange with other cations. Such regeneration is normally performed with hydrochloric acid aqueous solutions or sulfuric acid aqueous solutions. For example, we show in the below the case of the counter cation is Na^+ .

Product	DIAION™ UBK530	DIAION™ UBK550	DIAION™ UBK535	DIAION™ UBK555
Chemical structure				
Ionic form	Na		Ca	
Appearance index	> 95			
Apparent density (g/L-R)	810	825		855
Ion-exchange capacity (meq/mL)	> 1.6	> 1.9		> 2.0
Water content (%)	52.0-55.0	46.0-49.5		42.0-46.0
Particle size distribution	200-240 μm > 85 %		190-240 μm > 85 %	